FINDINGS

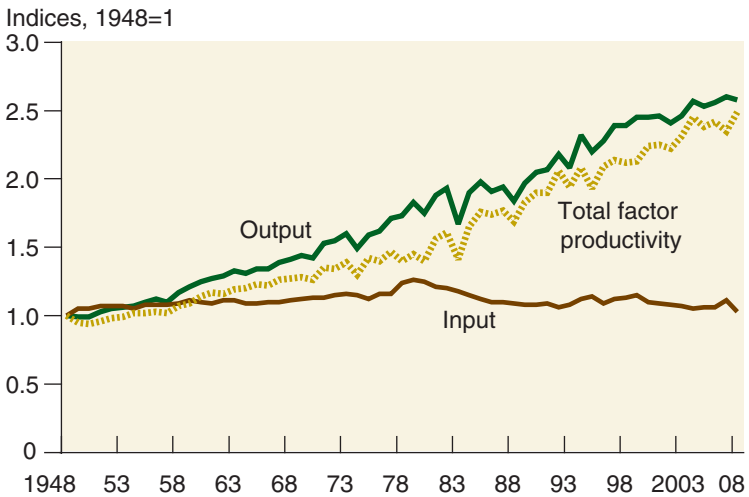
Is U.S. Agricultural Productivity Growth Slowing?

Productivity growth, a major determinant of economic expansion, is vital for promoting an improved standard of living. Increasing U.S. agricultural productivity can reduce commodity prices for U.S. consumers and free land, labor, capital, and other inputs for use elsewhere in the economy.

Long-term agricultural productivity is driven by innovations in animal and crop genetics, chemicals, equipment, and farm organization. Public agricultural research funding, which historically has driven innovation, faces budgetary pressure in the U.S., therefore raising concerns about current and future U.S. productivity growth. If research and innovation slow and productivity growth slackens, the inability to keep pace with increasing global commodity demand could lead to price increases. Slower productivity growth could also contribute to increased environmental problems as farmers intensify use of land and chemicals to produce more output in the absence of innovation.

Productivity can be measured by a single factor, such as output per acre (yield). However, yield can be a misleading measure of productivity since it can be boosted by adding other inputs, such as chemicals and labor. ERS measures total factor productivity (TFP) by taking into account all outputs and inputs. TFP measures changes in the efficiency with which all inputs are transformed into outputs.

U.S. agricultural input use was steady while total factor productivity expanded from 1948 to 2008



Source: USDA, Economic Research Service, Agricultural Productivity in the United States, www.ers.usda.gov/data/agproductivity/


Bruce Fritz, USDA/ARS

ERS data show that total farm output grew by 158 percent from 1948 to 2008, but total inputs used in agriculture remained largely unchanged. However, the composition of the input mix changed dramatically. While labor use declined by 78 percent and land use by 28 percent over those 60 years, chemical use grew fivefold from 1948 to 1980 before leveling off. Nevertheless, TFP growth in U.S. agriculture over the period has been steady, at 1.52 percent per year, a rate exceeding that of a majority of other U.S. industries and of most other nations' agricultural sectors.

TFP growth can fluctuate considerably from year to year, largely in response to weather events or to changes in input use. For example, droughts and floods caused sharp short-term reductions in output, and in TFP growth, in 1983, 1988, 1993, and 1995. In 2007, producers altered cropping patterns in response to an expansion in demand for corn-based ethanol. Farmers increased corn acreage sharply and boosted chemical use without raising average corn yields or TFP. These are examples of short-term fluctuations that can obscure long-term changes in TFP growth. Even though the rate of growth in public funding for agricultural research has slowed, statistical analyses of ERS productivity accounts through 2008 did not reveal a corresponding slowdown in long-term rates of agricultural productivity growth.

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This finding is drawn from . . .

ERS Data on Agricultural Productivity in the United States, available at: www.ers.usda.gov/data/agproductivity/

"Productivity and International Competitiveness of European Union and United States Agriculture, 1973-2002," by V.E. Ball, J-P. Butault, C. San Juan, and R. Mora, in *Agricultural Economics* (September 2010).